Sosyoekonomi

2025, Vol. 33(64), 287-297

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2025.02.12
Date Submitted: 31.07.2024
Date Revised: 12.12.2024
Date Accepted: 17.03.2025

How Do Central Bank Policy Rates and Inflation Affect Stocks in Fragile-Five Economies? Evidence from Panel PMG-ARDL Approach

Ali Osman ÖZTOP *(https://orcid.org/0000-0002-7568-5927), Muğla Sıtkı Koçman University, Türkiye; aliosmanoztop@mu.edu.tr*

Kırılgan Beşli Ekonomilerinde Merkez Bankası Politika Faizi ve Enflasyon Hisse Senetlerini Nasıl Etkilemektedir? Panel PMG-ARDL Yaklaşımından Elde Edilen Bulgular

Abstract

This study examines the dynamic relationship between the central bank policy rate, inflation, and stock exchange index in the Fragile Five economies (Brazil, India, Indonesia, South Africa, and Türkiye) using monthly data from July 2005 to March 2023. Employing the Panel PMG-ARDL approach, we find a positive and significant effect of inflation on stock exchange indices, while central bank policy rates exert a substantial and negative impact. The Error Correction Model confirms cointegration among the variables, corroborating the long-run relationships established in the Panel ARDL estimations. Both inflation and central bank policy rates emerge as significant joint Granger causes of stock exchange indices, highlighting their predictive power.

Keywords : Fragile Economies, Stock Market, Macroeconomy, Panel ARDL.

JEL Classification Codes : G12, G7, C32, E44.

Öz

Bu çalışmada Kırılgan Beşli ekonomilerinde (Brezilya, Hindistan, Endonezya, Güney Afrika ve Türkiye) merkez bankası politika faizi, enflasyon ve borsa endeksi arasındaki dinamik ilişki Temmuz 2005 - Mart 2023 dönemine ait aylık veriler kullanılarak araştırılmıştır. Panel PMG-ARDL yaklaşımını kullanarak, enflasyonun borsa endeksleri üzerinde pozitif ve anlamlı bir etkisi olduğunu, merkez bankası politika faizlerinin ise önemli ve negatif bir etkisi olduğu tespit edilmiştir. Hata Düzeltme Modeli, değişkenler arasındaki eşbütünleşmeyi doğrulamakta ve Panel ARDL tahminlerinde kurulan uzun dönemli ilişkileri desteklemektedir. Hem enflasyon hem de merkez bankası politika faizleri, borsa endekslerinin önemli ortak Granger nedenleri olarak ortaya çıkmakta ve tahmin güçlerini vurgulamaktadır.

Anahtar Sözcükler : Kırılgan Beşli, Borsa, Makroekonomi, Panel ARDL.

1. Introduction

Recent developments in global financial markets have accelerated capital inflows into emerging economies, resulting in heightened volatility. The growing economic integration driven by globalisation has further enhanced financial mobility (Nasseh & Strauss, 2000). Among emerging economies, India, Brazil, Indonesia, Türkiye, and South Africa -collectively called the Fragile Five by Morgan Stanley- have experienced significant economic and financial impacts from various global dynamics over the past decade. While the Federal Reserve Bank's (FED) quantitative easing policies, including "tapering," have played a role in shaping the economic environments of these countries, this study focuses on the influence of domestic economic indicators, such as central bank policy rates and inflation, on stock market performance within these economies.

In a globalising world, capital and portfolio investments are gaining importance. Investing in the stock market contributes to stable economic growth by enabling companies to raise capital, repay debts, and maintain corporate expansion, in addition to meeting investors' return expectations (Tripathi & Arnav Kumar, 2015). Stock market investments can stimulate economic activity in developing countries, attract foreign investment, and offer opportunities for business growth and development. However, much of the scholarly literature has focused on developed markets, with less attention paid to emerging markets (Mauro, 2003). As a result, the impact of external disruptions stemming from the fluctuations in FED interest rates is expected to pose more serious risks to the financial stability of these countries. Therefore, prioritising these fragile five economies becomes a necessity.

In theory, a rise in inflation has a negative impact on stock prices, while a decline in inflation has a positive effect on stock prices. When inflation rises, central banks typically raise interest rates to curb it. This leads to higher company borrowing costs and lower profits and investment levels. The result can be a fall in share prices. Conversely, central banks can lower interest rates when inflation falls, stimulating economic activity and increasing stock prices (Modigliani & Cohn, 1979). However, there are different views in the literature on the impact of inflation on stock prices (Al-Khazali, 2003; Valcarcel, 2012). Humpe & McMillan (2020) demonstrate that short-term and long-term inflation increases have distinct effects on stock prices. While there is a negative relationship between inflation and stock prices in the short run, in the long run, stock prices rise in line with consumer prices and provide a hedge against inflation in G7 countries.

Previous studies have focused on the fragile five countries but primarily used time-series data. In contrast, our study utilises panel data to examine the impact of policy interest rates and inflation on stock market indices. We employ the Panel PMG-ARDL method to derive robust conclusions from our analysis, leveraging the extensive data set available. Additionally, the Panel ARDL analysis accounts for country-specific effects and accommodates variations in aggregate terms and short-run coefficients. This is particularly advantageous when studying a group of countries, as it offers flexibility that may not be

achievable through time-series analysis alone. Additionally, stock market performance is a key indicator of overall economic performance and a significant concern for policymakers, regulators, and investors. This study examines the relationship between the stock market and macroeconomics, providing policy recommendations for policymakers to ensure effective economic stability.

This study employs panel data analysis to investigate the short- and long-term impacts of central bank interest rates and inflation on stock market indices in the Fragile Five countries. The paper makes valuable contributions to the literature in several respects: (i) by emphasising the dependence of economic growth and financial stability in developing countries on global capital flows, it provides findings that will guide policymakers in these countries; (ii) while the existing literature has generally focused on advanced economies, this study aims to fill the gap in the literature by focusing on the Fragile Five countries and using panel data analysis; (iii) it adds a new perspective to the existing theoretical debates on the relationship between inflation and stock market indices and tests the theoretical frameworks with empirical findings; (iv) it provides valuable information for investors and market participants on how to act in emerging markets, leading to more informed investment decisions.

2. Literature

The impact of inflation and central bank policy rates on stock market indices remains a topic of debate in the literature, with inconclusive findings attributed to differences in research methodologies. Existing empirical studies generally exhibit differences due to the varying treatments of independent variables, country-specific analyses, a focus on advanced economies, and the application of diverse econometric methods. These differences, coupled with variations in the study periods, contribute to the lack of consensus on the relationship between inflation, central bank policy rates, and stock market indices.

The academic literature offers a wealth of insights into the impact of interest rates and inflation on stock prices. One prominent theory, put forth by Fisher (1930), posits that stocks can serve as a hedge against inflation. The theory maintains that to preserve the real return on stocks, the return should align with inflation. Conversely, Fama (1981) posits that the inverse correlation between actual stock returns and inflation observed after 1953 is attributable to indirect influences, whereby predictions of more salient real factors shape stock returns.

The nexus between long-run interest rates and stock returns, as posited by economic theory, underscores a more pronounced relationship when compared to short-run interest rates. Short-run interest rates are often used as proxies for expected inflation. Long-run interest rates influence stock prices through present value models and discount rates (Abdullah & Hayworth, 1993). Cotton (2022) finds that unexpected monetary policy shifts, specifically a one-basis-point increase in five-year interest rates, lead to a significant 3.56-basis-point decrease in stock prices across nine advanced economies. Using the ARDL

bounds test, Alzoubi (2022) finds that the central bank's increase in the policy rate to control inflation has had a negative impact on the Amman Stock Exchange, covering the years 1991 and 2020.

Although these studies provide insight into the effects of inflation and interest rates on stock prices, there is a lack of comprehensive research focusing on Fragile-Five economies. For example, Sumaryato et al. (2021) analysed the effect of inflation on the Indonesian Composite Index (IHSG). They showed that the increase in the amount of money supplied to IHSG was negligible. On the other hand, Sia et al. (2023) reveal that inflation has an asymmetric effect on the Indonesian stock market index in the short and long run. The findings demonstrate that both positive and negative alterations in inflation have deleterious consequences. Fahlevi (2019) examined the effects of macroeconomic factors on the stock prices of companies in Indonesia's LQ45 Index between 2013 and 2017. The study reveals that interest rates have a significant impact on stock prices, whereas inflation does not have a similar effect. Joshi and Giri 2015) found that exchange rates and inflation have a significant impact on stock price fluctuations in India. These results suggest that investors may consider stocks as long-term investments to offset the negative effects of inflation on purchasing power, which aligns with Fisher's (1930) hypothesis. Tursoy (2019) analysed the relationship between stock prices and interest rates using ARDL. It is found that interest rates have a negative impact on stock prices in Türkiye, which is consistent with the "expected cash flow hypothesis."

In summary, although studies have been conducted, more focused research is still needed to address the relationships between inflation, central bank policy rates, and stock exchange indices in Fragile-Five economies. Further research in these economies would significantly contribute to understanding the intricate dynamics of stock market behaviour in response to inflation and central bank policies.

3. Data and Model Estimation

3.1. Data

From July 2005 to March 2023, a panel dataset has been utilised to evaluate how the stock market index in fragile-five economies is impacted by both the central bank policy rate (R) and inflation (π). In exploring these dynamic relationships, this study examines the consumer price index (CPI) in conjunction with the closing prices of stock market indices across the fragile five economies[1]. Central bank policy rate and CPI data are obtained from Bank for International Settlement (BIS) reports, while stock market index data are obtained from the Yahoo Finance website. Stock market indices (SP) are calculated in logarithmic form. The transformation to a logarithmic form brings the data distribution closer to a normal distribution, an underlying assumption for many econometric models, including PMG-

[1] *IBOVESPA, BSE Sensex, IDX Composite, JSE All Share Index, and BIST100, representing Brazil, India, Indonesia, South Africa, and Türkiye, respectively.*

ARDL. Table 1 summarises the descriptive statistics for each macroeconomic variable used in this study.

Table: 1
Descriptive Statistics

	Mean	Std. Dev.	Median	Skewness	Kurtosis
R					
Brazil	10.29	3.8	11	-0.21	-0.19
India	6.56	2.16	6.5	0.88	0.81
Indonesia	6.42	1.35	6.5	-0.31	-0.89
South Africa	6.55	1.97	6.5	0.96	0.97
Türkiye	11.2	5.23	8.5	0.75	-0.48
π					
Brazil	0.0046	0.0034	0.0044	0.22	4
India	0.0044	0.0072	0.0029	6.61	69.1
Indonesia	0.0047	0.0067	0.0046	-0.06	4.2
South Africa	0.0046	0.0041	0.0038	0.53	3.2
Türkiye	0.0113	0.0158	0.0085	3.61	22.8
SP Return					
Brazil	11.07	0.35	11.03	0.09	-0.63
India	10.08	0.52	10.04	0.02	-0.73
Indonesia	8.26	0.52	8.46	-0.96	-0.22
South Africa	7.80	0.39	7.96	-0.51	-1.05
Türkiye	11.25	0.58	11.24	0.88	1.55

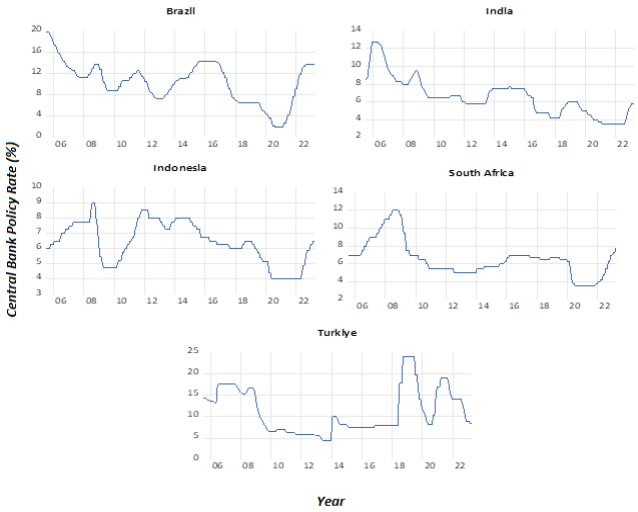
Note: Std. Dev. represents standard deviation.

Central bank policy rates show diverging averages, with Brazil and Türkiye recording relatively higher averages of 10.29% and 11.20%, respectively, compared with India, Indonesia and South Africa, which have lower averages of between 6.42% and 6.56%. This divergence underscores the different monetary policy stances in these economies. Similarly, examining inflation rates reveals significant differences, with Türkiye, in particular, having a significantly higher mean inflation rate (0.0113) than other countries. Skewness and kurtosis values further illuminate the distributional characteristics, indicating varying degrees of asymmetry and peakedness in these macroeconomic indicators.

Additionally, the descriptive statistics for stock market indices reveal distinct characteristics among these economies. Brazil and South Africa have higher mean stock values than India, Indonesia, and Türkiye, suggesting different market capitalisation or trading activity levels. The skewness and kurtosis measures reveal different shapes and distributional characteristics within stock market data, indicating the degree of deviation from the normal distribution observed in these financial measures.

Figure 1 illustrates the evolution of central bank policy rates in the fragile five economies. The size and frequency of policy rate adjustments vary across countries and show different patterns. In particular, Brazil and Türkiye tended to change their policy rates more sharply than the other countries surveyed. Notably, Türkiye's unorthodox monetary policy, implemented after 2018, stands out in the context of diverse global monetary strategies. In contrast, India and Indonesia gradually changed their policy rates. Notably, South Africa's policy rate remained relatively stable throughout the period, demonstrating a tendency towards consistency amidst global fluctuations in monetary policy adjustments.

Figure: 1
Central Bank Policy Rate (%)



3.2. Model Estimation

This research comprises 1065 observations from the Fragile Five countries (N = 5) from September 2005 to March 2023 (T = 213). In panel data analysis, using the generalised moment method estimator is inappropriate when the sample size is less than the number of periods (N < T). Conversely, the panel ARDL technique is the preferred analysis method in this study, given that (T > N) (Akinsola & Odhiambo, 2020)[2].

Before performing the analysis, panel unit root tests are used to test whether cross-sectional dependence exists for similar fragile economic structures. The lag length was chosen using the Akaike information criterion (AIC) (See Appendix).

The results of the panel unit root tests are presented in Table 2. Both at the levels and in the first differences, there is evidence of no unit roots for some series, especially policy rates (e.g., LLC and IPS tests), while there is no strong evidence of unit roots for stocks and inflation in general. The first differences show strong evidence of no unit root for all series. The statistically significant results in all tests support this conclusion. In particular, the LLC, ADF, and PP tests show that the series are stationary in first differences. Generally, the

[2] *The Variance Inflation Factor (VIF) was employed to evaluate the presence of multicollinearity between variables. First, the VIF values of the independent variables were calculated manually using the two-way fixed effects model. This method yielded a value of 1.14 for the π and R variables, respectively. Subsequently, the calculation based on the "pooling" model yielded a value of 1.003 for both variables. Both approaches remained within the acceptable range of VIF < 2, indicating no significant.*

variables show an integrated order of I(1), except for the central bank policy rate, which may demonstrate stationary behaviour at order I(0). This suggests that the variables are appropriate for panel data analyses.

Table: 2
First Generation Unit Root Test Results

Model	Level			1st difference		
	SP	R	π	SP	R	π
Trend and Intercept						
LLC	0.55	--1.87**	3.04	-5.30***	-6.96***	-9.99***
Breitung	-0.49	-0.67	-1.07	-3.84***	-4.36***	-3.88***
IPS	-1.87**	-2.88***	2.93	-11.97***	-7.78***	-11.86***

*Note: ** and *** indicate 5% and 1% significance levels.*

After confirming the panel ARDL's stationarity, the Hausman test was conducted to determine the choice between the MG and PMG models. The Hausman test results are in Table 3.

Table: 3
Hausman Test

	β			
	MG	PMG	Difference	SE
π	0.1764	0.5563	-0.3800	0.5137
R	0.0473	-0.0425	0.0900	0.1113
Hausman	0.54 (0.76)			

*Note: ** and *** indicate 5% and 1% significance levels.*

The test results reveal that the null hypothesis of long-run homogeneity is inadmissible. $(\chi^2(2) = 0.54, p - value = 0.76)$. Subsequently, the PMG is favoured as the estimator due to the non-systematic coefficient differences.

4. Empirical Results

The following model examines the long-term relationship between π, R and SP:

$$lnSP_{it} = \alpha_{0i} + \alpha_{1i} ln\pi_{it} + \alpha_{2i} R_{it} + u_{it} \quad (1)$$

In Eq. (1), SP_{it} is the logarithm of the stock market indices in period t for country i. α_{0i} represents "the constant term", while $(\alpha_{1i}, \alpha_{2i})$ are the parameters specify π and R coefficients, and u refers to the error term.

Table: 4
Panel ARDL Coefficients Long-Run Estimation Results

	β	SE	t-Statistic	p-value
π	0.56	0.15	3.71	0.00***
R	-0.04	0.01	-3.19	0.00***

*Note: ** and *** indicate 5% and 1% significance levels.*

Table 4 presents the PMG's estimate of the long-run relationship between inflation, the central bank's policy rate, and stock market indices. Inflation's long-term impact on stock

market indices is significant and positive. For example, a 1% increase in π can be associated with a 0.56% increase in the logarithm of SP. Conversely, the long-term effect of the R on SP is negative and significant. A 1% increase in the R is associated with a 0.04% decrease in the logarithm of SP.

In Eq. (2), speed of adjustment ($\hat{\varphi}$) is the coefficient of the cointegrating equation and $\left(y_{i,t-1} + \beta_i' x_{i,t}\right)$ is the error correction term (Wickens & Breusch, 1988). Short-run equation model as below:

$$\Delta SP_{it} = \sum_{k=1}^{p-1} \lambda_{ik}^{*} \Delta SP_{i,t-k} + \sum_{k=0}^{q-1} \delta_{ik}' \Delta x_{i,t-k} + \hat{\varphi}\left(SP_{i,t-1} + \beta_i' x_{i,t}\right) + \omega_i + \varepsilon_{it} \quad (2)$$

PMG model's short-run estimation, as displayed in Table 5, reveals key relationships between variables. There is also a significant negative association with π_{t-1} in the short run, which implies a significant decline in stock market prices for each unit increase in the inflation rate. Conversely, both SP_{t-1} and R_{t-1} do not display statistically significant impacts on the SP in the short-run. These findings suggest that while inflation notably influences the stock exchange prices, the relationships with stocks and the R are not firmly established in the short run within this model's framework.

Table: 5
Panel ARDL Coefficients Short-Run Estimation Results

	β	SE	t-statistics	p-values
$\hat{\varphi}$	-0.03	0.01	-3.43	0.01**
SP_{t-1}	0.07	0.05	1.37	0.17
π_{t-1}	-0.92	0.41	-2.22	0.03**
R_{t-1}	0.01	0.01	1.08	0.28
C	0.27	0.13	2.09	0.04**

*Note: ** and *** indicate 5% and 1% significance levels.*

Moreover, $\hat{\varphi}$ has the correct sign (negative) and is significant. The coefficient value ($\hat{\varphi}$) of -0.03 suggests that stock prices respond very slowly to short-run shocks and that it will take time for stock prices to reach long-run equilibrium.

5. Concluding Remarks

This study finds that central bank policy interest rates negatively impact stock market indices, consistent with the "Expected Cashflow Hypothesis" in the literature. Additionally, inflation has a negative impact on stock indices in the short term but a positive effect in the long term. This result suggests the phenomenon known as the "Fisher effect," particularly in the long term.

These findings offer valuable insights into the influence of macroeconomic indicators on financial markets. Especially in emerging and fragile economies, the different short- and long-term effects of variables such as policy interest rates and inflation on market behaviour create a critical decision space for policymakers. Central banks should adopt an approach to understand investor behaviour and market reactions better when setting policy interest rates.

Likewise, inflation-targeting policies have significant implications for short-term market equilibrium, investor confidence, and long-term market stability.

The contributions of this study extend beyond policy recommendations; they also make significant contributions to the literature. By analysing the effects of macroeconomic variables on stock markets in the so-called fragile five countries, the study adds a unique perspective to the body of knowledge in this field. However, such analyses should be extended to different emerging markets to develop a more comprehensive perspective. For instance, by focusing on periods of economic shocks or specific crisis moments, the impact of macroeconomic indicators on markets could be examined in more detail.

Overall, this study sheds light on the intricate relationship between macroeconomic variables and financial markets in emerging markets. Suppose policymakers and market actors make decisions that consider the short-term and long-term dimensions of these relationships. In that case, it will create a more stable and secure financial environment.

References

Abdullah, D.A. & S.C. Hayworth (1993), "Macroeconometrics of Stock Price Fluctuations", *Quarterly Journal of Business and Economics*, 32(1), 50-67.

Akinsola, M.O. & N.M. Odhiambo (2020), "Asymmetric effect of oil price on economic growth: Panel analysis of low-income oil-importing countries", *Energy Reports*, 6, 1057-1066.

Alam, M. & G.S. Uddin (2009), "Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries", *International Journal of Business and Management*, 4(3), 43-51.

Al-Khazali, O.M. (2003), "Stock Prices, Inflation, and Output: Evidence from the Emerging Markets", *Journal of Emerging Market Finance*, 2(3), 287-314.

Alzoubi, M. (2022), "Stock market performance: Reaction to interest rates and inflation rates", *Banks and Bank Systems*, 17(2), 189-198.

Anari, A. & J. Kolari (2001), "Stock Prices and Inflation", *Journal of Financial Research*, 24(4), 587-602.

Asprem, M. (1989), "Stock prices, asset portfolios and macroeconomic variables in ten European countries", *Journal of Banking & Finance*, 13(4-5), 589-612.

Cotton, C. (2022), "Monetary Policy and Stock Prices", *SSRN Electronic Journal*, https://doi.org/10.2139/ssrn.4109471.

Erdem, C. et al. (2005), "Effects of macroeconomic variables on Istanbul Stock Exchange indexes", *Applied Financial Economics*, 15(14), 987-994.

Fahlevi, M. (2019), "The Influence of Exchange Rate, Interest Rate and Inflation on Stock Price of LQ45 Index in Indonesia", *Proceedings of the First International Conference on Administration Science (ICAS 2019)*, https://doi.org/10.2991/icas-19.2019.34.

Fama, E. (1981), "Stock Returns, Real Activity, Inflation, and Money", *The American Economic Review*, 71(4), 545-565.

Fisher, I. (1930), *The Theory of Interest*, NewYork: MacMillan.

Humpe, A. & D.G. McMillan (2020), "Macroeconomic variables and long-term stock market performance. A panel ARDL cointegration approach for G7 countries", *Cogent Economics & Finance*, 8(1), 1816257.

Joshi, P. & A.K. Giri (2015), "Dynamic Relations between Macroeconomic Variables and Indian Stock Price: An Application of ARDL Bounds Testing Approach", *Asian Economic and Financial Review*, 5(10), 1119-1133.

Laopodis, N.T. (2013), "Monetary policy and stock market dynamics across monetary regimes", *Journal of International Money and Finance*, 33, 381-406.

Mauro, P. (2003), "Stock returns and output growth in emerging and advanced economies", *Journal of Development Economics*, 71(1), 129-153.

Modigliani, F. & R.A. Cohn (1979), "Inflation, Rational Valuation and the Market", *Financial Analysts Journal*, 35(2), 24-44.

Nasseh, A. & J. Strauss (2000), "Stock prices and domestic and international macroeconomic activity: A cointegration approach", *The Quarterly Review of Economics and Finance*, 40(2), 229-245.

Sia, P.-C. et al. (2023), "Asymmetric effects of inflation rate changes on the stock market index: The case of Indonesia", *Journal of International Studies*, 16(1), 128-141.

Sumaryato, S. et al. (2021), "The Impact of Money Supply and the Inflation Rate on Indonesia Composite Index: Case Study in Indonesia Stock Exchange 2008-2017", *IJEBAR International Journal of Economics, Business and Accounting Research*, 5(2), 196-213.

Tripathi, V. & A. Kumar (2015), "Relationship between Macroeconomic Factors and Aggregate Stock Returns in BRICS Stock Markets - A Panel Data Analysis", in: *New Age Business Strategies in Emerging Global Markets* (104-123), Excel India Publishers.

Tursoy, T. (2019), "The interaction between stock prices and interest rates in Turkey: Empirical evidence from ARDL bounds test cointegration", *Financial Innovation*, 5, 7.

Valcarcel, V.J. (2012), "The dynamic adjustments of stock prices to inflation disturbances", *Journal of Economics and Business*, 64(2), 117-144.

Wickens, M.R. & T.S. Breusch (1988), "Dynamic Specification, the Long-Run and The Estimation of Transformed Regression Models", *The Economic Journal*, 98(390), 189-205.

APPENDIX

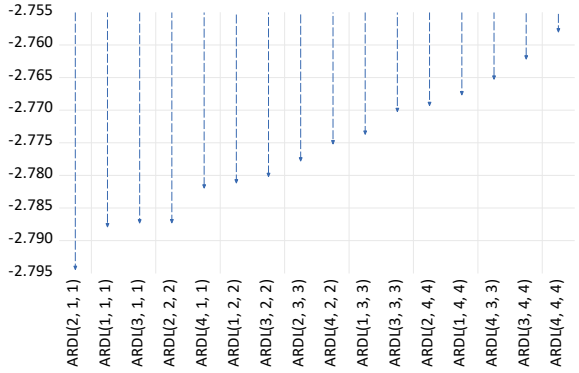
Before the analysis, panel unit root tests are used to determine whether cross-sectional dependence exists among similar fragile economic structures. The lag length was selected using the Akaike Information Criterion (AIC). Table A and Fig. A show the results of the Akaike criterion.

Table: A
Model Selection Criteria

Model	LogL	AIC	BIC	HQ	Specification
5	1486.94	-2.7941	-2.6662	-2.7456	ARDL(2, 1, 1)
1	1478.52	-2.7876	-2.6833	-2.7481	ARDL(1, 1, 1)
9	1488.21	-2.7870	-2.6354	-2.7295	ARDL(3, 1, 1)
6	1493.21	-2.7870	-2.6117	-2.7205	ARDL(2, 2, 2)
13	1490.42	-2.7817	-2.6063	-2.7152	ARDL(4, 1, 1)
2	1485.01	-2.7809	-2.6292	-2.7234	ARDL(1, 2, 2)
10	1494.48	-2.7799	-2.5808	-2.7044	ARDL(3, 2, 2)
7	1498.25	-2.7775	-2.5548	-2.6930	ARDL(2, 3, 3)
14	1496.88	-2.7749	-2.5522	-2.6904	ARDL(4, 2, 2)
3	1491.11	-2.7734	-2.5744	-2.6979	ARDL(1, 3, 3)
11	1499.29	-2.7699	-2.5235	-2.6765	ARDL(3, 3, 3)
8	1503.80	-2.7690	-2.4989	-2.6665	ARDL(2, 4, 4)
4	1497.96	-2.7673	-2.5209	-2.6739	ARDL(1, 4, 4)
15	1501.69	-2.7649	-2.4948	-2.6625	ARDL(4, 3, 3)
12	1505.07	-2.7618	-2.4681	-2.6504	ARDL(3, 4, 4)
16	1507.90	-2.7577	-2.4402	-2.6373	ARDL(4, 4, 4)

*Note: ** and *** denote 5% and 1% significance levels, respectively.*

Figure: A
Akaike Information Criteria[3]



[3] *Fig. A and Table A present the results of model selection criteria for the ARDL (autoregressive distributed lag) model. The AIC and BIC are information criteria that penalise models for their complexity. A lower AIC or BIC indicates a better model. In this case, the model with the lowest AIC is the ARDL (2, 1, 1), which has an AIC of -2.7941. The model with the lowest BIC is the ARDL (1, 1, 1) model, which has a BIC of -2.6833. Log-likelihood is a measure of the fit of a model to the data. A higher log-likelihood indicates a better fit. In this case, the model with the highest log-likelihood is the ARDL(2, 1, 1) model, which has a log-likelihood of 1486.94. Based on the model selection criteria considered, the ARDL(2, 1, 1) model is the best model for the data in this case. This model has the highest log-likelihood, the lowest AIC, and the lowest HQ.*

Öztop, A.O. (2025), “How Do Central Bank Policy Rates and Inflation Affect Stocks in Fragile-Five Economies? Evidence from Panel PMG-ARDL Approach”, *Sosyoekonomi*, 33(64), 287-297.